

Control of Garden Pests in Alberta

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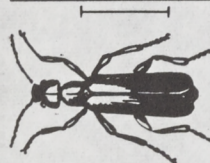
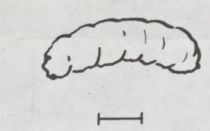
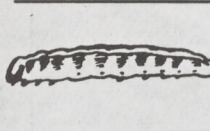





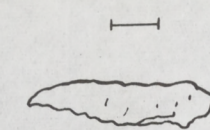





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Directions and Precautions for Using Coyote Getters	Leaflet
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CONTROL OF GARDE

PEST	DESCRIPTION OF PEST	PLANTS ATTACKED	TIME AND TYPE OF INJURY	CONTROL RECOMMENDATIONS
 ANTS— Various species.	Too common to require description. Winged ants have elbowed "feelers" and "swelling" on the "waist".	Do not eat vegetation. Climb trees, flowers, for nectar or aphid "honey-dew".	Throughout season. Dig holes and build mounds in lawns, gardens, flower beds. Invade houses in search of sweet food.	Dust or spray infested area with Chlordane or Aldrin. Locate nests and rake or dig in the poison (4). Repeat weekly until eradicated.
 APHIDS— (plant lice) various species; nymphs and adults both injurious.	Small, soft-bodied, various colored — grey, green, black; wingless or filmy wings; usually in clusters.	Peas, beans, delphiniums, currants, turnips, potatoes, etc.	Throughout season. Aphids suck plant sap. Leaves curled, deformed, discolored and may drop off. Plants wilt, become unthrifty.	Spray insects on warm day with nicotine sulphate (1), pyrethrum (3), or Malathion (4). Direct spray to underside of leaves forcefully. Apply before leaves curl and repeat as required.
 BEE WEBWORM— larva of small moth; only larva injurious.	Slim, active caterpillar, up to 3/4 inch long, green to yellow with fine black lines and circles.	Most garden plants, legumes, rape, flax, pigweed, Russian thistle, etc.	June to August. Migrate in numbers from weeds when these dry up or become defoliated. Leaves eaten; if numerous — complete defoliation.	Prevent invasion of garden by destroying surrounding weeds. Spray or dust weeds with Toxaphene (4). Once infested, spray or dust non-edible foliage with Toxaphene at 2 lbs. technical per acre. Treat edible parts with derris (2) or pyrethrum (3).
 BLISTER BEETLE— Several species. Only adults injurious.	Large, soft bodied, spotted, grey, black or metallic blue beetles to 3/4 inch long. May appear suddenly, often in swarms.	Potatoes, beans, caragana, onions, beets, flowers, etc.	May to August; flowers and foliage eaten by beetle.	Spray or dust beetles on edible vegetation with pyrethrum (3) or derris (2). On shrubs, trees and potatoes use DDT dust or emulsible concentrate sprays of DDT, Aldrin or Chlordane (4). Act promptly and repeat daily if necessary.
 CABBAGE ROOT MAGGOT— Larva only injurious.	Maggot stage of small fly, similar to housefly. Larva is legless, white, about 1/4 inch long. Eggs are laid on or near base of stem.	Cabbage, cauliflower, turnips, radishes, etc.	May to September; roots grooved or bored into. New transplants may die, older plants wilt.	Apply drench of Heptachlor or Dieldrin (4) to rows at rate of 1 gallon to 50 ft. of row. Apply to seedlings at transplanting or use later as eggs or young maggots seen. Treat anyway if troubled last year. Repeat in 10 days or after rain.
 CABBAGE WORM — Larva only injurious.	Soft, velvety green caterpillar is larva of white butterfly. Larva is up to 1 1/4 inches long, with faint gold line down back.	Cabbage, cauliflower, Brussel sprouts, turnips, radish, etc.	Throughout summer. Large circular holes eaten in leaves and heart. Leaves green pellets which discolor cauliflower.	Dust young plants with DDT (4) or Malathion (4). After heads begin to form, use only derris (2) or pyrethrum (3) dusted into plant.
 CURRENT MAGGOT— Larva only injurious.	Small, white maggots or "worms" in berries are larvae of yellow fly, with brown banded wings, smaller than housefly.	Currants, gooseberries.	Flies dislike sunlight, roost towards centre of bush, under leaves, for couple weeks before laying eggs in partly developed berries. Infested berries ripen prematurely and drop.	Spray centre of bush and undersides of leaves with DDT (4) or Methoxychlor (4) when at least half of blossoms have faded or fallen; repeat in 10 days. Control is often difficult.
 COLORADO POTATO BEETLE— Adult and larva injurious.	Round-backed, hard shelled beetles with black and yellow stripes on back. Larvae are soft, humpbacked, brick-red grubs with black markings.	Potatoes, tomatoes, egg plant, occasionally other plants.	Early June to late August. Foliage eaten away. If numerous, plants completely defoliated.	Dust plants with derris (2), DDT (4) or Toxaphene (4), or apply DDT, Aldrin, Chlordane or Toxaphene emulsible concentrate sprays (4) as soon as beetles or grubs appear on plants.
 CUTWORMS— Only larvae injurious.	Larvae of medium-sized moths which are harmless. Soft, cylindrical caterpillars up to 1 1/2 inches long. Red Backed — reddish with brick-red band on back. Army — dark olive green with rows of spots or yellowish band on back. Pale Western — light grey with straw colored head, few body markings. Curl up when disturbed. Attack all garden crops.		Early spring to end June. Some feed below ground cutting off plants near surface. Others feed on foliage above ground at night; remain in soil during day.	Scatter poison bait (5) on warm evening; or spray soil surface with Dieldrin, Aldrin or Chlordane (5 times strength Formula No. 4); apply 1 gal. per 500 sq. ft.; or use prepared dust at equivalent rate. Do not apply above insecticides to edible portions, which may be treated with derris (2) or pyrethrum (3). Protect cabbage, etc., with can or paper collars, sunk 3 inches into soil.
 FLEA BEETLES— Only adults injurious in Alberta.	Tiny, quick jumping beetles, about 1/16 inch long, shining black or black and yellow.	Seedlings of cabbage, turnip, rape, radish, potatoes, etc. May also damage older plants.	Early May to July; August onward. Small, round holes eaten in leaves, especially on seedlings. Leaves turn brown and dry.	Dust or spray with derris (2) or DDT (4) as soon as seedlings emerge or are transplanted. Repeat as required. Use derris only on cabbage heads and other edible parts.
 GRASS-HOPPERS— Both nymphs and adults injurious.	Various species; too common to require description.	Most garden crops.	May throughout season. Entire plants devoured by adults whereas nymphs feed on more succulent growth and damage slower.	Control while 'hoppers small by spraying non-edible foliage in and around garden with emulsible concentrate sprays of Aldrin, Chlordane, Dieldrin, Heptachlor (4). Broadcast poisoned bait (5) early on sunny mornings. Repeat as necessary.
 ONION MAGGOT— Only larva injurious.	Maggot stage of small fly; larvae are pure white, legless maggots similar to cabbage maggots, 3/8 inch long at maturity.	Onions, leeks, chives, etc.	Throughout season but most damage to seedlings. (June is bad month). Roots and lower stems tunnelled, seedlings wilt and die, infested onions rot.	Treat moistened seed with calomel or 50% wettable DDT powder, equal in weight to dry seed used; plant immediately after treatment. Drench plants and two inches each side of row with DDT wettable powder spray (4) at 1 gal. for 40 feet of row at 10-day intervals. Make first application when onions in loop stage or in summer in late July if eggs located.
 RED TURNIP BEETLE— Both adult and larva injurious.	Beetles are bright red with 3 broad black stripes on back (wings closed). Mature larvae are 1/2 inch long, black above, paler beneath.	Turnips, cabbage, cauliflower, mustards, rape, radish, etc.	Damage usually towards end of June, again in August. Foliage eaten. More common in fields where cruciferous crops grown continuously.	Rotate crops to avoid cruciferous crops two years in a row on same soil. Destroy cruciferae weeds as mustards, shepherd's purse, etc., from around garden. Dust edible vegetables with derris (2), others can be treated with DDT (4).
 SLUGS—	Not true insect. Soft-bodied, slimy, legless creature, whose shape changes with movement. Leaves shiny trail.	Cabbages, cauliflower, beans, lettuce, potatoes, flowers, but have wide range.	Late May to fall. More troublesome in wet years. Feed at night by rasping off tender parts of plants. make holes in leaves, etc.	Sanitation — clean up boards, rubbish, weed piles where slugs hide and breed; use commercial metaldehyde baits or poison bait (5) scattered on warm evenings. One inch wide belts of lime on soil surface effective if stays dry.
 TENT CATER-PILLARS— Only larvae injurious.	Caterpillars are larvae of various moths; up to 2 inches long, usually velvety, bluish-grey. Spend nights in clusters.	Most trees and shrubs except Manitoba Maple and evergreens. Forest species do not make white webbing "tents".	Early spring to mid-June. Outbreaks come in cycles. Caterpillars devour young buds and leaves. Move on once plant defoliated.	Remove and destroy egg rings from twigs before spring. Spray masses of pests at or near tree trunk with nicotine sulphate (1), DDT (4) or pyrethrum (3). DDT on vegetation gives longer protection than others.
 WIREWORMS— Only larvae injurious.	Larvae of black "click" beetles. Slender, wiry bodied, shiny, yellow worms. Live in soil about 6 years average as larvae.	Potatoes, corn, lettuce, onions, carrots and others.	Seeds and seedlings damaged in spring by boring. Seeds may not sprout, seedlings wilt. Potatoes and root crops tunnelled.	Seed garden with grain treated with Lindane or Aldrin preparations; grain may be left for season or plowed under after 3 weeks growth, followed by vegetable planting. Soil may be treated with Aldrin or Heptachlor (2 ozs. tech. per 1,000 sq. ft. or 5 lbs. tech. per acre) or Chlordane (5 ozs. tech. per 1,000 sq. ft. or 10 lbs. tech. per acre). Spray or dust on surface and work 4 inches into soil before planting.
 POCKET GOPHER—	Stout bodied, short legged rodent, often misnamed "mole". Brownish coat, external fur-lined cheek pouches, heavy claws on front feet, smaller than "prairie gopher".	Carrots, parsnips and most root crops eaten. Others damaged by burrowing.	Throughout season. Dig tunnels 6 to 14 inches deep, shoving dirt out of lateral tunnels into crescent-shaped mounds. Eat roots, bulbs, etc.	Trap with "gopher" or Macabee traps, set in main tunnel, cover to exclude all light. Run car exhaust gas into main tunnel until sufficient pressure shown by leakage. Use poisoned baits (6a) or (6b). Probe main tunnel near new mounds; insert 1 tbsp. bait; cover opening tightly, taking care to avoid dirt covering bait.



FORMULAE AND INSTRUCTIONS



PESTICIDE APPLICATION

1. Apply at recommended rates. Reduced rates may not give control; heavier rates are wasteful and may damage crop.
2. Apply dusts or sprays to give complete and uniform coverage of top and bottom surfaces of leaves.
3. Dusts should be applied in late evening or early morning, when calm and plants are damp with dew. For small areas, cheesecloth bag makes a good duster.
4. Sprays can be applied at most times but avoid wet, hot or windy periods. Emulsion concentrate sprays can be readily applied by most sprayers. Wettable powders should be well agitated and a larger nozzle opening used. For field work, wettable powder sprays cannot be satisfactorily applied with a conventional field sprayer; use one with cylinder or rotary pumps and a mechanical agitator in the tank. Do not use sprayers in which 2,4-D was used, without first cleaning it thoroughly, as small traces of 2,4-D will injure garden plants (formula below).
5. For biting insects use a stomach poison and apply poison onto affected plant. For sucking insects, concentrate on applying the poison onto the pests. Many modern insecticides are of both the stomach and contact type.

Measures used:
1/2 fl. oz. = 1 tablespoonful (tbsp.)
= 3 teaspoonful (tsp.)

Formula 1 — NICOTINE SULPHATE SPRAY

	Small Quantity.	Large Quantity.
Nicotine Sulphate 1 1/2 tsps.	2 ozs. (5 tbsps.)	8 ozs.
Soap (non-detergent) 1 oz.		
Water 1 gal.		10 gals.

Dissolve soap in warm water, cool and add nicotine sulphate. Mix thoroughly. Contact spray — apply to cover insects.

Formula 2 — DERRIS (Rotenone)

Derris dust containing 4% rotenone 1 part
Flour, sulphur or other inert carrier 4 parts
or 1 oz. of 4% wettable dust into 1 gal. water.

Mix thoroughly. Contact poison — apply to insects and affected parts of plant. Commercial dusts or sprays should be handled as directed. Non-toxic to humans.

Formula 3 — PYRETHRUM SPRAY

Fresh pyrethrum powder 1 oz. Increase
Water 1 gal. accordingly

Mix powder in water and use as fresh spray. Commercial sprays should be used as directed. Non-toxic to humans.

Formula 4 — HYDROCARBON INSECTICIDES

EMULSIBLE CONCENTRATE	Small Quantity.	Acre Quantity.
Aldrin, 2 1/2 lbs. technical per gal.	1 tsp.	12 fl. oz.
Dieldrin, 1 1/2 lbs. technical per gal.	1/2 tsp.	7 fl. oz.
Heptachlor, 2 1/2 lbs. technical per gal.	1 tsp.	12 fl. oz.
Chlordane, 10 lbs. technical per gal.	1 tsp.	8 fl. oz.
Toxaphene, 10 lbs. technical per gal.	2 tsps.	16 fl. oz.
DDT, 25%, 2 1/2 lbs. technical per gal.	1 tbsps.	40 fl. oz.
* Malathion 50%, 5 lbs. technical per gal.	1 tsp.	20 fl. oz.
Water	1 gal.	sufficient to spray one acre

WETTABLE POWDER	Small Quantity.	Acre Quantity.
Aldrin 20%	2 1/2 tsps.	15 oz.
Dieldrin 25%	1 tsp.	4 oz.
Heptachlor 25%	2 tsps.	12 oz.
DDT 50%	2 tbsps.	2 lbs.
Methoxychlor 50%	1 tbsps.	1 lb.
* Malathion 25%	2 tsps.	2 lbs.
Water	1 gal.	80 gals.

* Organic Phosphorus Compound.

FOLLOW DIRECTIONS ON CONTAINER; IF CONCENTRATES OTHER THAN LISTED, MODIFY QUANTITIES ACCORDINGLY.

Formula 4 (a) — ROOT MAGGOTS ONLY

WETTABLE POWDER	Small Quantity	Acre Quantity.
Aldrin 20%	4 tsps.	20 lbs.
Dieldrin 25%	3 tsps.	16 lbs.
Heptachlor 25%	3 tsps.	16 lbs.
Water	1 gal.	80 gals.

Formula 5 — POISONED BAIT

	Small Quantity.	Acre Quantity.
Bran	1 gal.	25 lbs.
Water	1 qt.	2 1/2 gals.
Aldrin, Chlordane or Dieldrin Emulsible Concentrates.	2 tbsps.	2/5 pint

If concentrates other than listed under Formula 4, modify quantities accordingly. Mix poison with water and stir with bran for uniform moistness; avoid lumps.

Formula 6 — POCKET GOPHERS

6 (a)

- 3 qts. wheat
- 1/4 oz. strychnine alkaloid (powder)
- 1/4 oz. baking soda
- 1 tsp. petrolatum or cup grease
- 1 tsp. laundry starch
- 1 tbsps. stock molasses

Mix strychnine and rest of material (mix starch in little cold water first) in 4 ozs. boiling water. Stir thoroughly and mix well with 3 qts. of wheat.

6 (b)

- Cut baits of carrots or parsnips 2 qts.
- Strychnine alkaloid (powder) 1/4 oz.

Cut vegetables into pieces about 1/2 x 1/2 x 1 1/2 inches. Dust strychnine on baits in small amounts, turning and mixing baits for uniform coverage. Use fresh.

CAUTION — Strychnine is a dangerous poison. Handle and store safely at all times.

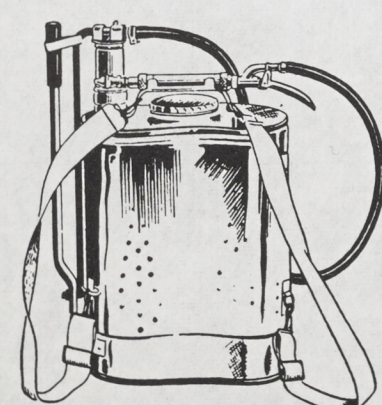
ANTIDOTES

At the first symptom of insecticide poisoning, usually headache or nausea.

1. **CALL DOCTOR IMMEDIATELY**, giving him name of insecticide and antidote listed on container.
2. Keep patient warm and quiet.
3. If poison has been swallowed, induce vomiting at once by giving an emetic consisting of 2 teaspoons of salt or ground mustard in glass of warm water or by sticking a finger down the throat.
4. For hydrocarbons (DDT, Chlordane, Lindane, etc.), after vomiting, give patient hot tea or coffee and 1 oz. epsom salts.
5. If poison has been inhaled, remove patient into fresh air, loosen clothing, and if necessary, apply artificial respiration.
6. Drops or particles in the eyes should be removed by flushing with water.
7. Check for any other measures on antidote recommendations on container.



SHOULDER STRAP SPRAYER.



KNAPSACK SPRAYER.

NOTE — CLEANING A CONTAMINATED SPRAYER

1. Using clean water, fill and flush out sprayer three times.
2. Fill tank with water and add 1 cup of household ammonia to each 3 to 4 gallons of water. Allow this mixture to stand in sprayer for 1 to 2 days and then run through machine.
3. Wash out sprayer with soapy water.
4. Rinse sprayer again with clean water.

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This chart is a complete revision of Circular No. 42 (June, 1943) which was prepared by the late J. L. Eaglesham, Alberta Department of Agriculture.

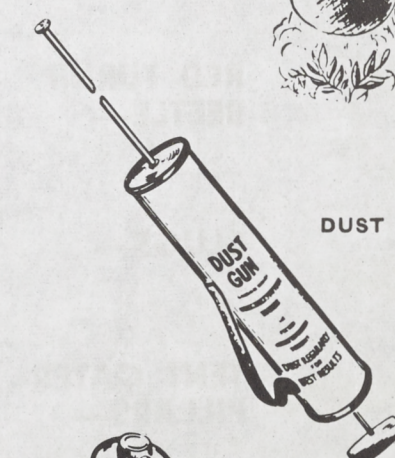
PRECAUTIONS

1. **KEEP ALL POISONS AND EQUIPMENT USED PLAINLY LABELLED AND OUT OF REACH OF CHILDREN, PETS AND LIVESTOCK.**
2. Only Formula (2) Derris and (3) Pyrethrum are safe to apply to cabbage, cauliflower, lettuce, etc., after heads are formed and to any other edible part for immediate consumption. Vegetables and fruit may be eaten safely two days after treatment with nicotine sulphate. Do not use hydrocarbons on edible parts within 3 weeks of consumption or harvest (Malathion 2 weeks before).

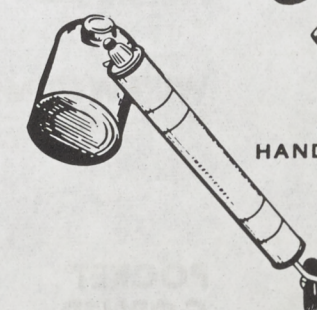
3. Carefully read and follow directions on insecticide container.
4. Avoid inhaling insecticide dusts, sprays or vapors; wear a respirator, particularly when handling dusts.
5. Avoid insecticide contact with the skin. Wash hands and face thoroughly with soap and warm water after exposure or use.
6. When handling insecticides avoid rolling cigarettes, smoking or any other means of contaminating lips or mouth.



DUSTING WITH JUTE BAG.



DUST GUN.



SMALL HAND SPRAYER.

POISON EARLY — BEFORE DAMAGE IS DONE !

BE CAREFUL WITH ALL POISONS !

